

Wildlife Terrestrial Habitat Question 1 – Management Indicator Species (MIS)

Goal: Maintain the abundance and distribution of habitats, especially old-growth forests, to sustain viable populations. Also maintain habitat capability sufficient to produce wildlife populations that support the use of wildlife resources for sport, subsistence, and recreational activities.

Objectives: In addition to objectives included in the Biodiversity Ecosystem section, include a young-growth management program to maintain, prolong, and/or improve understory forage production and to increase future old-growth characteristics in young-growth timber stands for wildlife.

Background: The National Forest Management Act requires that the Forest Service provide for the diversity of plants and animals, based upon the suitability and capability of each National Forest, as a part of meeting overall multiple use objectives (16 USC 1604(g)(3)(B)). This direction requires that fish and wildlife habitat be managed to maintain viable populations of existing native and desired non-native vertebrate species. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others (36 CFR 219.3).

MacDonald and Cook (2007) documented that 82 species of mammals and eight amphibians are known to occur, or have recently occurred, in Southeast Alaska. Over 80 percent of this area is under federal stewardship in the Tongass National Forest (MacDonald and Cook 2007). There are an additional eighteen species of marine mammals found in Southeast Alaska waters that depend entirely on the ocean environment, and 45 bird species considered casual or accidental visitors to Southeast Alaska. The diversity of wildlife on the Forest provides many opportunities for consumptive and non-consumptive uses including commercial, general, and subsistence hunting; and photographic and viewing activities (USDA 2008c).

Wildlife Terrestrial Habitat Question 1: Are populations and habitat trends for Management Indicator Species (MIS) consistent with expectations? Are these trends tied to changes in habitat conditions or other factors? If they are tied to habitat conditions, is there a direct relationship with forest management, climate change or other factors? Terrestrial MIS include red squirrel, black bear, brown bear, marten, river otter, Sitka black-tailed deer, mountain goat, gray wolf, Vancouver Canada goose, bald eagle, red-breasted sapsucker, hairy woodpecker, and brown creeper.

The 1982 regulations to implement the National Forest Management Act require that Management Indicator Species (MIS) be identified as part of each forest plan. MIS serve multiple functions in forest planning: 1) MIS establish explicit Forest Plan objectives for fish and wildlife habitat, 2) MIS facilitate analysis of Forest Plan alternatives, and 3) MIS provide a means to monitor the effect of forest plan implementation. Much of the direction for MIS is outlined in CFR 219.19, together with direction for ecosystem diversity and species diversity. As such, MIS represents one part of a broader fabric of biodiversity and species management.

A main criterion for the selection of the Tongass MIS was whether or not timber harvest activities

potentially affect their key habitats. Another was the cumulative amount of activities that had occurred prior to the 1997 Forest Plan on the Tongass and in Southeast Alaska. In general, the selected species may be affected either by timber harvest directly or indirectly. Increased human access provided by roads and/or logging camps may be the source of these potential affects.

The thirteen MIS species identified for the Tongass National Forest are primarily associated with the spruce and hemlock forests of Southeast Alaska that represent 98 percent of the productive old-growth (POG) forests of the Tongass. POG habitat provides essentially all of the highly important habitats and the preponderances of the moderately important habitat for most of the MIS. However, some species use a variety of different habitat but rely on prey species associated with old-growth (e.g. wolves and their prey the Sitka black-tailed deer).

Proposals to modify the list of terrestrial MIS on the Tongass have been made over the years. The most recent proposal was made in 2011 by an interagency group of wildlife biologist representing the Tongass National Forest, U.S. Fish and Wildlife Service, and the Alaska Department of Fish and Game. Initially, the group identified twenty-two management challenges and eighteen terrestrial wildlife species that may be responsive to these challenges. After further evaluation using guiding principles and evaluation criteria adopted from a similar process conducted in the Rocky Mountain Region of the U.S. Forest Service, the group reduced the number of species to six. These six potential terrestrial MIS were further prioritized by the group into three categories:

- Highest: Sitka black-tailed deer and American marten
- Intermediate: black bear and brown bear
- Lowest: mountain goat and bald eagle

By identifying six potential MIS in three priority classes, the group provided the Tongass and the public multiple alternatives for consideration depending on budget and the status of the MIS program for the Tongass. As a result of the evaluation, the group also identified several points regarding monitoring and information needs for wildlife species.

Designation of species as MIS is one of several designations that may motivate monitoring and information gathering for wildlife species. Therefore, species emphasized due to Sikes Act considerations, highlighted as threatened, endangered or sensitive represent other examples of species that may be considered for emphasis in monitoring or other information gathering programs. This information will be considered as part of the five year review of the 2008 Tongass Forest Plan.

Evaluation Criteria

We determine whether habitat changes and population trends for the thirteen Tongass MIS are consistent with expectations as defined in the 2008 Forest Plan (Forest Plan) Amendment Final Environmental Impact Statement (FEIS; USDA 2008c). Key habitats for each of the thirteen Tongass MIS are defined by the Suring habitat capability models for each species and are listed below in table 1. Generally, habitat change is analyzed using the Size Density geographic information system (GIS) feature class, which classifies forested stands according to their average tree size and the density of trees in a stand. POG forest is defined as Size Density (SD) classes 4H (hydric soils), SD4S (south aspect), 4N (north aspect), 5H, 5N, 5S, and 67, where the number in the class acronym corresponds to the timber volume class (4=8-20 MBF; 5=20-30 MBF; 6=30-50 MBF; 7>50 MMF). Certain MIS (e.g. marten and brown creeper) prefer high volume POG (HPOG), which is defined as SD classes 5N, 5S, and 67. In addition, changes in road density are measured as an indicator of changing human access that can cause increased mortality in species such as wolf and marten.

The Alaska Department of Fish and Game (ADFG) is the state regulatory agency for all game species in

Alaska. The Federal Subsistence Board also regulates subsistence hunting on federal lands in Alaska. In addition, the U.S. Fish and Wildlife Service (USFWS) regulates populations of migratory birds and bald eagles. Therefore, we rely on these entities for reporting population status and trends when possible. The Breeding Bird Survey (BBS) and, more recently, the Alaska Landbird Monitoring Survey (ALMS), are our best sources for monitoring populations of songbirds. Following is a description of each of the population data sources used in this report.

Management and Harvest Reports

These are ADFG's annual reports of the trends in hunted and trapped wildlife species in Alaska. ADFG biologists make estimates of population trends based on a combination of factors including conversations with trappers, hunters, pilots, and other biologists; anecdotal reports, incidental observations by ADFG staff, harvest data, hunter and trapper questionnaires, sealing information, and suspected prey availability. Quantitative indicators are used for estimating trends in deer and mountain goat populations. Quantitative estimates of local populations of mountain goat, black bear, brown bear, and wolves are periodically made as well.

ADFG Sealing Records - The Convention on International Trade in Endangered Species (CITES) program in Alaska, requires that certain furbearers (e.g. wolves, marten, river otter, black bear, and brown bear), taken by any means and for any purpose, be sealed by an authorized representative. The exception is brown bears that are taken under a subsistence permit and taken in, and not removed from, a subsistence area do not need to be sealed. Sealing involves tagging the hide with an identification number issued by the USFWS. This allows the USFWS to track the international trade of CITES species and ensure that they were taken within state specified management regulations.

For each sealed animal, the ADFG collects information about the take such as the location where the animal was killed and the amount of time they spent hunting/trapping the animal. If one assumes that fewer days are required to harvest an animal when hunting/trapping a more dense population then days/animal may be an index of the population.

Hunter/Trapper Questionnaires - ADFG also administers statewide hunter and trapper questionnaires and publishes these data annually. Hunters and trappers are asked whether they believe the species population has remained the same, increased, or decreased compared to the year before. Brown bear hunters provide more detailed information on their hunt including the number of days they hunted and whether they were successful or not. This provides more accurate data on hunter effort compared to the sealing data.

Wildlife Terrestrial Habitat 1 Table 1. Summary of important habitat as described by the size density (SD) model and population data sources for Tongass management indicator species (MIS)

MIS	Important Habitats	Population Data Sources
Alexander Archipelago Wolf (<i>Canis lupus ligoni</i>)	POG - provides habitat for prey	ADFG sealing records, research, reports, and trapper questionnaire.
American Marten (<i>Martes americana</i>)	High volume POG - intercepts snow, provides cover and habitat for prey.	ADFG sealing records, reports, research and trapper questionnaire.
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	High volume POG near shorelines - provides nesting and perching habitat	USFWS population survey
Black Bear (<i>Ursus americanus</i>)	POG and salmon streams.	ADFG sealing records, reports, and research.
Brown Bear (<i>Ursus arctos</i>)	POG and salmon streams.	ADFG sealing records, reports, research and hunter survey.
Brown Creeper (<i>Certhia americana</i>)	High Volume POG – Tall, large diameter trees w/ plentiful snags and decadent timber	BBS
Hairy Woodpecker (<i>Picoides villosus</i>)	HPOG with snags and dying trees	ALMS, BBS
Mountain Goat (<i>Oreamnos americanus</i>)	POG - intercepts snow and provides cover	ADFG hunter survey and reports
Red-breasted Sapsucker (<i>Sphyrapicus ruber</i>)	Low volume POG and decadent trees and young snags for nesting	ALMS
Red Squirrel (<i>Tamiasciurus hudsonicus</i>)	POG - Cone producing trees	ADFG trapper questionnaire
River Otter (<i>Lutra canadensis</i>)	POG - adjacent to shoreline/streams	ADFG sealing records and trapper questionnaire
Sitka Black-tailed Deer (<i>Odocoileus hemionus sitkensis</i>)	POG - low elevation, intercepts snow, provides cover	ADFG/TNF deer pellet count transects, subsistence harvest reports, and ADFG hunter surveys.
Vancouver Canada Goose (<i>Branta canadensis</i>)	Forested wetlands for nesting and brood rearing	USFWS waterfowl population survey

Abbreviations: ADFG = Alaska Department of Fish and Game; ALMS = Alaska landbird monitoring system; BBS = Breeding bird survey; POG = Productive old-growth; POW = Prince of Wales Island; SD = Size Density Model Codes; TNF = Tongass National Forest



**Wildlife Terrestrial
Habitat 1 Picture 1.**
Brown Creeper
Photo by Gwen Baluss

Bird Surveys

The Alaska Landbird Monitoring Survey (ALMS) and Breeding Bird Survey (BBS) data will be analyzed every 5 years to assess population trends for management indicator bird species. Because migratory birds are far ranging species that require a diversity of habitat for foraging, breeding, and wintering, population trends are generally detected at larger observational scales than those traditionally used to manage lands.

ALMS - The Tongass completes ALMS surveys annually. The ALMS is administered by the U.S. Geological Survey (USGS) in Anchorage, Alaska and is designed to monitor long-term trends in breeding populations of landbirds (and other bird species) within all ecoregions of Alaska. Variable circular point counts are used to survey bird species by sight and sound. The sampling design employs a ten kilometer by ten kilometer sampling grid laid over the entire state of Alaska. From this grid, survey blocks are chosen randomly within each ecoregion and federal land management unit. Each block contains twenty-five survey points. This randomized off-road grid design is intended to eliminate biases inherent in roadside surveys such as the Breeding Bird Survey. Habitat data aimed at keying out forest type and structure, and variables such as distance to water and snags are collected at each point. Detailed survey methods can be found in Handel and Cady (2004).

BBS - The Tongass also completes BBS surveys annually and the BBS is also administered by USGS staff from the Patuxent Wildlife Research Center in Maryland. The BBS is designed to provide a continent-wide perspective of population change in breeding birds. The survey produces an index of relative abundance rather than a complete count of breeding bird populations. The data analyses assume that fluctuations in these indices of abundance are representative of the population as a whole. BBS routes are 24.5 miles long, with a total of fifty stops located at 0.5 mile intervals along the route. The Tongass completes approximately fifteen routes per year. It is thought that a minimum of fourteen routes, with ten years of surveys each, are needed to conduct a meaningful trend analysis of BBS data.

USFWS Bald Eagle Surveys - USFWS has been conducting aerial surveys of bald eagles in Southeast Alaska since 1967. Surveys are conducted on thirty randomly selected plots that are surveyed at five year intervals during the breeding season. These surveys provide a reasonably accurate and precise estimate of the population and are effective for monitoring trends.

USFWS Waterfowl Surveys - The USFWS censuses waterfowl, including Vancouver Canada geese, in Southeast Alaska. These generally take five years to complete. All saltwater shorelines are surveyed once in summer and in winter (Jack Hodges *pers. comm.*). One-fifth of the total saltwater shoreline is surveyed per year. USFWS conducts surveys by air and uses results from surveys conducted by boat to correct their estimate. Three correction surveys are conducted by boat in the summer and winter.

Deer Pellet Group Surveys

Estimating Sitka black-tailed deer population abundance in Southeast Alaska is difficult because much of the landscape is densely vegetated; therefore, estimation techniques based on seeing the animals do not work well here. For this reason, ADFG uses fecal pellet counts as an index for deer population abundance. The assumption is that changes in the density of pellet groups reflect changes in the population. It is also assumed that a difference in these indices between areas reflects differences in the size of the respective populations. The ADFG reports that the pellet data “are useful in looking at long-term trends and should detect population changes over a period of several years” (Person and Titus 2002). The data are collected cooperatively between the Tongass National Forest and ADFG. Counts are

conducted along permanent transects. Transects are not surveyed every year and routes located in areas that receive high hunting pressure, or areas where there is concern for the population are prioritized. Pellet group datasets date back to the early 1980s. For a more detailed description of the sampling designs and field methods used see Kirchhoff and Pitcher (1988).

Monitoring Results

We report the changes in the Tongass Management Indicator Species habitat and populations since implementation of the 2008 Forest Plan. We summarize those results here as well as providing links to the individual Management Species Indicator Reports in the Appendix.

Each individual report is organized into two sections:

- **General MIS Habitat Changes and Trends** – Summarizes habitat changes and trends across the Forest which are relevant for several MIS species.
- **Species Specific Report summaries** – Organized by MIS species and reports the habitat and population trends for each species.
 - Brown creeper (*Certhia americana*)
 - Red-breasted sapsucker (*Sphyrapicus ruber*)
 - Hairy woodpecker (*Picoides villosus*)
 - Vancouver Canada goose (*Branta canadensis fulva*)
 - Bald eagle (*Haliaeetus leucocephalus*)
 - River otter (*Lutra canadensis*)
 - Red squirrel (*Tamiasciurus hudsonicus*)
 - Black bear (*Ursus americanus*)
 - Brown bear (*Ursus arctos*)
 - Marten (*Martes americana*)
 - Alexander Archipelago wolf (*Canis lupus ligoni*)
 - Sitka black-tailed deer (*Odocoileus hemionus sitkensis*)
 - Mountain goat (*Oreamnos americanus*)

Using a geographic information system and records of timber harvest stored in the Forest Service Activities Tracking System, we measured changes in the percent of productive old growth (POG), high-volume POG (HPOG), and big-tree POG (SD67) that was available prior to large-scale logging on the Tongass (estimated to be the year 1954). Road densities are also measured as an indicator of changes in access that may contribute to greater mortality of wolves, black bears, and brown bears.

There has been little change in MIS habitats since implementation of the 2008 Forest Plan. The Tongass encompasses just over 16.8 million acres, of which roughly 5.4 million acres were POG, 2.3 million acres were HPOG, and 700,000 were SD67 in 1954. By 2006 approximately 92, 87, and 80 percent remained, respectively. Since implementation of the 2008 Forest Plan there has been very little harvest (one percent or less) at the Forest-wide and biogeographic province scale and this change in forest cover is within projections for after 100+ years and full implementation of the 2008 Forest Plan. Also, no additional value comparison units (VCUs) since implementation of the 2008 Forest Plan have crossed the threshold for being at high risk of losing their full suite of functions in the matrix. This is defined by the 2008 Forest Plan as having had 33 percent or more of their 1954 POG harvested.

Analysis of road densities across the Forest, measured as miles of road per square mile of land and at the scale of wildlife analysis area (WAAs), indicates road densities have largely remained stable since 2006 with some local, but slight, increases and decreases. Using a road density of 1.0 mi/mi² as a benchmark, the number of WAAs exceeding 1.0 mi/mi² has remained at twenty-six since implementation of the 2008 Forest Plan and is well below that predicted for after 100+ years and full implementation of the Plan (48 WAAs).

For species population status and trend we largely rely on the assessments by the agencies responsible for their regulation such as the Alaska Department of Fish and Game for hunted and trapped mammal species and the U.S. Fish and Wildlife Service (USFWS) for bald eagle and Vancouver Canada geese. Long-standing bird survey datasets such as the Breeding Bird Survey (BBS) and the Alaska Land-bird Monitoring Survey (ALMS) were analyzed by the U.S. Geological Survey for trends in passerine bird and woodpecker MIS.

These agencies rely on varying types of data for determining population status and trends. The USFWS surveys of waterfowl, including Vancouver Canada geese, and the bald eagle result in fairly robust quantitative estimates. However, the expense of these surveys necessarily means that they are done infrequently. Some populations are virtually impossible to estimate and so indicators are used to inform their management. This is the case for marten and river otter for which the ADFG uses a suite of indicators thought to indicate abundance and changes in populations over time. Indicator data are relatively inexpensive to gather and so are measured much more frequently, but by their nature are not reliable for indicating short-term trends.

Based on these data, MIS populations region-wide appear to have fluctuated within the historic range of variability over the past ten years. However some local populations of game species, such as the Nunatak Bench population of mountain goat (Yakutat area), continue to be suppressed after illegal-harvest and severe winters.

Estimated trends using the ALMS (ten years of data) and BBS (seventeen years of data) for brown creeper, hairy woodpecker, and red-breasted sapsucker are imprecise, statistically non-significant, and inconsistent. The exception is for hairy woodpecker for which both surveys indicate a weak, imprecise, and non-statistically significant negative trend. Further investigation of these data is warranted to determine if the trend detection can be improved with the addition of survey sites.

Action Plan

The following actions are recommended, contingent on funding. As part of the five year review in FY 2013, complete the review of the interagency proposal to modify the list of terrestrial MIS. Work with the USGS-BRD Anchorage to further explore the existing ALMS dataset to determine the current power to detect trends in other forest dwelling birds, conduct power analyses of the ALMS data to determine the number of additional surveys needed to detect trends in red-breasted sapsucker and hairy woodpecker and other old-growth dependent species for which the dataset shows promise, and further analyze relationships between habitats and species occurrence. Continue working with the Alaska Department of Fish and Game on developing population estimation methods for the wolves on Prince of Wales Island. Develop a Size Density vegetation features class for the condition in 1954 that is compatible with the 2013 version of Size Density. Continue contract with Northern Ecologies LLC to develop habitat models for MIS with a projected completion date of February 2014. Develop guidance, perhaps as part of the Tongass Young Growth Strategy, for the benefits of various young growth treatments for specific MIS wildlife habitats.

See [Wildlife MIS Monitoring Report](#) in the appendices section for more information in response to this monitoring question.